

REMARKS

With the above amendments, claims 1, 5-8, 9, 12-18, 19 and 20 remain in the application. Claims 2, 4, and 10-11 are hereby canceled without prejudice. Claim 3 was previously canceled without prejudice. Claims 1, 5-8, 9, 12-15, 19 and 20 are hereby amended. No new matter is being added.

Double Patenting

Claims 1, 9, 16-18 and 20 were rejected under 35 USC 101 for double patenting in relation to USP 6,947,605. The claims are hereby amended so as to overcome this rejection.

In particular, claim 1 is now amended so as to incorporate the claim limitations of original claims 2 and 4. Specifically, claim 1 is now requires dependence on "... a **global** characteristic ... wherein the global characteristic comprises a global measure of color variation that is calculated over an image." (Emphasis added.) Hence, applicants respectfully submit that amended claim 1 now overcomes this rejection.

Similarly, claim 9 is now amended so as to incorporate the limitations of original claims 10 and 11. Hence, applicants respectfully submit that amended claim 9 now overcomes this rejection.

Claims 16-18 depend from claim 9. Therefore, applicants respectfully submit that claims 16-18 now also overcome this rejection.

Claim 20 is now amended so as to specify that dependence "... on at least one **global** characteristic" (Emphasis added.) Hence, applicants respectfully submit that amended claim 20 now also overcomes this rejection.

Claim Rejections under 35 U.S.C. § 103

Muruyama and admitted art in view of Acharya (Section 5 of the Office Action)

Claims 1-2, 8-10, and 15-18 stand rejected as unpatentable over Muruyama (USP 5,978,513) and admitted art in view of Acharya et al. (USP 6,094,508). Applicants respectfully submit that this rejection is moot in view of the amended claims.

In particular, independent claim 1 is now amended such that it incorporates the limitations from original claims 2 and 4. In other words, amended claim 1 now has the scope of original claim 4. Therefore, this response discusses amended claim 1 (and dependents therefrom) below with respect to the rejection of original claim 4 (per section 7 of the office action).

Similarly, independent claim 9 is now amended such that it incorporates the limitations from original claims 10 and 11. In other words, amended claim 9 now has the scope of original claim 11. Therefore, this response discusses amended claim 9 (and dependents therefrom) below with respect to the rejection of original claim 11 (per section 7 of the office action).

Muruyama in view of Acharya (Section 6 of the Office Action)

Claims 19-20 stand rejected as unpatentable over Muruyama in view of Acharya et al. Regarding claim 19, applicants respectfully submit that this rejection is now moot. Regarding claim 20, applicants respectfully traverse this rejection with respect to the claim as now amended.

Regarding claim 19, independent claim 19 is amended so as to specify that the threshold function is “dependent on a global measure of color variation....” This limitation is similar to the limitation of original claim 4. Therefore, this response discusses amended claim 19 below with respect to the rejection of original claim 4 (per section 7 of the office action).

Regarding claim 20, claim 20 as amended now recites as follows.

20. A system for image processing, the system comprising:
an **encoder** that includes a **candidate edge chain identifier** for identifying candidate edge chains in an image being processed, **means for calculating a dynamic chain-based threshold function** that is dependent on at least one global characteristic of the image being processed, and a **threshold applicator** for applying the dynamic chain-based threshold function to the candidate edge chains; and
a **decoder** configured to operate in cooperation with the encoder, wherein the decoder also includes the **candidate edge chain identifier**, the **means for calculating**, and the **threshold applicator**.

(Emphasis added.)

As shown above, claim 20 requires that the encoder and the decoder **both** include the candidate edge identifier, means for calculating a dynamic chain-based threshold function, and the threshold applicator. This aspect is taught in the present application, for example, in FIG. 5 and the description on page 11, lines 12-22, which are reproduced below for convenience.

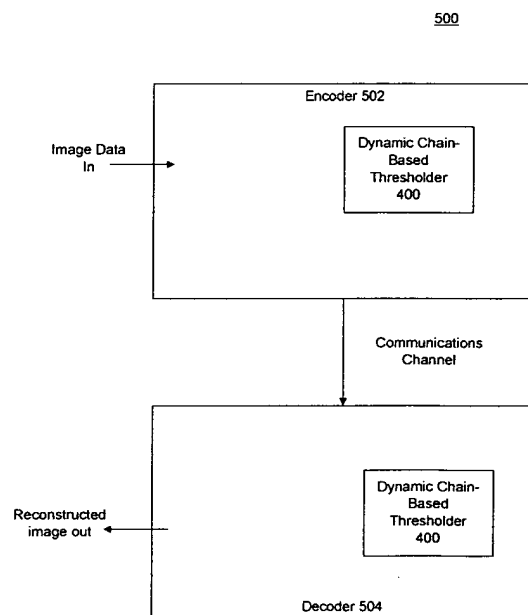


FIG. 5

FIG. 5 is a diagram depicting a system 500 in accordance with an embodiment of the invention. The system 500 includes both an encoder 502 and

a decoder 504. The encoder 502 may be, for example, incorporated into a video transmitting apparatus. Similarly, the decoder 504 may be incorporated into a video receiving apparatus operable in cooperation with the encoder 502. The encoder 502 may communicate video information by way of a communications channel suitable for transmission of digital data.

As shown in FIG. 5, both the encoder 502 and the decoder 504 may include and utilize the dynamic chain-based thresholder 400. This is advantageous in that, if both encoder and decoder use the same thresholder 400 to extract edges from images, then less information about the image needs to be transmitted. This reduces the bandwidth required to transmit video images while maintaining a visual quality level.

As described above, an advantage of the claimed invention is that less information about the image needs to be transmitted if both encoder and decoder use the same dynamic chain-based thresholder.

Muruyama does not disclose or teach a system where the **decoder** has its own chain-based thresholder. On the contrary, Muruyama describes its decoder as “decoding the signal encoded by the chain coding circuit 30” of the encoder. See column 14, lines 1-2. In other words, Muruyama discloses a system where the encoder has a chain coding circuit and where the decoder decodes the output of that circuit.

Acharya et al. also does not disclose or teach a system where the **decoder** has its own chain-based thresholder.

Therefore, for at least the above discussed reasons, applicants respectfully submit that amended claim 20 is now in form for allowance.

Muruyama, admitted art, and Acharya in view of Bonneau (Section 7 of the Office Action)

Amended claims 1, 5-8, 9, 12-18, and 19 stand rejected as unpatentable over Muruyama, admitted art, and Acharya et al. in view of Bonneau et al. (Amended claim 1 has a similar scope as original claim 4. Amended claim 9 has a similar scope as original claim 11. Amended claim 19 has a limitation similar to original claim 4.) Applicants respectfully traverse this rejection with respect to the amended claims.

Amended claim 1 now recites as follows.

1. A method for image processing, the method comprising:
applying a point-based threshold function to identify candidate edge chains in an image being processed;
determining a **dynamic chain-based threshold function** that is dependent on a global characteristic of the image being processed;
applying the dynamic chain-based threshold function to **selectively filter** the candidate edge chains; and
removing from a set of edge chains those candidate edge chains that fail to pass the dynamic chain-based threshold function,
wherein the global characteristic comprises a **global measure of color variation that is calculated over an image**.

(Emphasis added.)

As shown above, claim 1 now recites that the **dynamic chain-based threshold function** is dependent on a global characteristic, and that the dynamic chain-based threshold function is used to **selectively filter** the candidate edge chains. Even more specifically, claim 1 is now limited such that “the global characteristic comprises a **global measure of color variation** that is calculated over an image.”

None of the cited references (not Muruyama, nor admitted art, nor Acharya et al., nor Bonneau et al.) disclose or teach the claimed **dynamic chain-based threshold function** which is used to **selectively filter** the candidate edge chains. Furthermore, none of the cited references disclose or teach the claimed dynamic chain-based threshold function which is **dependent on a global measure of color variation**.

Regarding Muruyama and the admitted art, the Examiner has determined that neither Muruyama nor the admitted art describe a chain-based threshold that is dependent on a characteristic of the image being processed. (See page 4, lines 10-12 of the latest office action.)

Regarding Acharya et al, that reference discloses dynamic point-based thresholding. However, the claimed dynamic **chain-based threshold function to selectively filter the previously-identified chains** is an entirely separate and distinct step which is performed after the dynamic **pixel-based threshold function** of Acharya et

al. Hence, applicant respectfully submits that Acharya et al also does not disclose or teach the claimed invention as recited in amended claim 1.

Regarding Bonneau et al., this reference is cited for producing encoded images separated by color components. **However, neither Bonneau et al, nor Bonneau et al combined with the other references, teaches or suggests that a measurement of color variation in a color image may be used to vary a threshold function which is used to selectively filter candidate edge chains.**

For at least the above-discussed reasons, applicants respectfully submit that amended claim 1 is now patentably distinguished over the cited art.

Claims 5-8 depend from claim 1. As such, applicants respectfully submit that claims 5-8 are now patentably distinguished over the cited art for at least the same reasons discussed above in relation to claim 1.

Similar to claim 1, claim 9 now recites that the **dynamic chain-based threshold function** is dependent on a global characteristic, and that the dynamic chain-based threshold function is used to **selectively filter** the candidate edge chains. Even more specifically, claim 9 is now limited such that “the global characteristic comprises a **global measure of color variation** that is calculated over an image.” Thus, for at least the same reasons discussed above in relation to claim 1, applicants respectfully submit that claim 9 is now also patentably distinguished over the cited art.

Claims 12-18 depend from claim 9. As such, applicants respectfully submit that claims 12-18 are now patentably distinguished over the cited art for at least the same reasons discussed above in relation to claim 9.

Similar to claim 1, claim 19 now recites that the **dynamic chain-based threshold function** is dependent on a **global measure of color variation**. Hence, for at least the same reasons discussed above in relation to claim 1, applicants respectfully submit that claim 19 is now also patentably distinguished over the cited art.

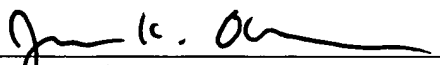
Conclusion

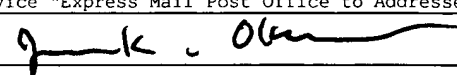
For at least the above reasons, it is respectfully submitted that claims 1, 5-8, 9, 12-18, 19 and 20 are now patentably distinguished over the cited art and are now in form for allowance.

The Examiner is invited to telephone the undersigned at (408) 436-2111 for any questions. If for any reason an insufficient fee has been paid, the Commissioner is hereby authorized to charge the insufficiency to Deposit Account No. 50-2427.

Respectfully submitted,
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